Research Paper | Computer Science | E-ISSN No : 2454-9916 | Volume : 3 | Issue : 4 | Apr 2017

AN AUTOMATED SYSTEM FOR MAKING CITY SMART USING INTERNET OF THINGS

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ABSTRACT

The Internet of Things(IoT) is changing our working environment and everyday life. The number of devices connected to the Internet is increasing rapidly and consequently. The new advancement in the wireless network technology makes sensor a powerful tool which can increase the speed and precision of decision making. In this project we will apply IoT for smart city services like water pollution, accident detection, weather monitoring, video surveillance and street light. So our system will help in faster detection of accident, water pollution, automatic working of street light and reduce the wastage of electricity. It will lead to a fully automated city services and make life of citizens more easy and convenient. It will also help in making a city safe and secure. Thus we are contributing to make city smart. It is an open and general implementation of IOT for city that consists of five applications of Smart City.

I. INTRODUCTION

The Internet of Things (IoT) is a recent communication paradigm that aims at making the Internet even more immersive and pervasive. Furthermore, by enabling easy access and interaction with a wide range of devices such as, for instance, home appliances, surveillance cameras, monitoring sensors, actuators, displays, vehicles, and so on, the IoT will foster the development of a number of applications that make use of the potentially large amount and variety of data generated by such objects to provide new services to citizens, companies, and public administrations.

II. EASE OF USE

The objective of this project is to implement services that support the smart city. The services that we are going to address are accident detection, street light control, water pollution detection, video surveillance and weather monitoring. These automated services will contribute in making a city smart.

The objective our project is to implement the services that support Smart City. The aim will be achieved by applying following objectives-

- To provide faster detection of accidents by providing its information to the nearby hospitals and police station via SMS.
- To reduce the overall wastage of electricity by controlling street lights.
- To reduce the pollution of water bodies by sensing the ph level of the water.
- Monitoring the weather conditions through a smart mobile app.
- Theft detection by using video surveillance.

III. PROJECT SCOPE

Internet of Things can be used in different domains such as Smart city, smart environment, security and emergencies, smart business process, smart agri-culture, domestic and home automation and healthcare. The scope of our project is smart city especially services like accident detection, street light control, water pollution detection, video surveillance and weather monitoring.

IV. HARDWARE INTERFACES

Raspberry Pi:
The Raspberry Pi is a single-board computer developed by the Raspberry Pi foundation. It uses a Linux kernel-based operating system. Compared to a desktop computer, the Raspberry Pi is limited in RAM and CPU power.

Sensors:
The sensors are used to coolct data from surrounding. They provide the env parameters like temperature,humidity, vibrations,noise/sound,etc.

Camera:
The camera is use for electronic motion picture acquisition hence the systemuses it for video surveillance.

Modem:
The modem is used as interface between Raspberry pi and Server.

V. SOFTWARE INTERFACES

j2SE:
Java Platform, Standard Edition or Java SE is a widely used platform for programming in the Java language. It is the Java Platform used to deploy portable applications for general use.

JDK:
The Java Development Kit (JDK) is a Sun Microsystems product that is used by Java developers. Since the introduction of Java, it has been by far the most widely used Java SDK.

Eclipse:
Eclipse is a multi-language software development environment that consist of an integrated development environment.(IDE) and an extensible plug-in system.

Android developement:
"Android software development" is the process which creates new applications for the Android operating system.

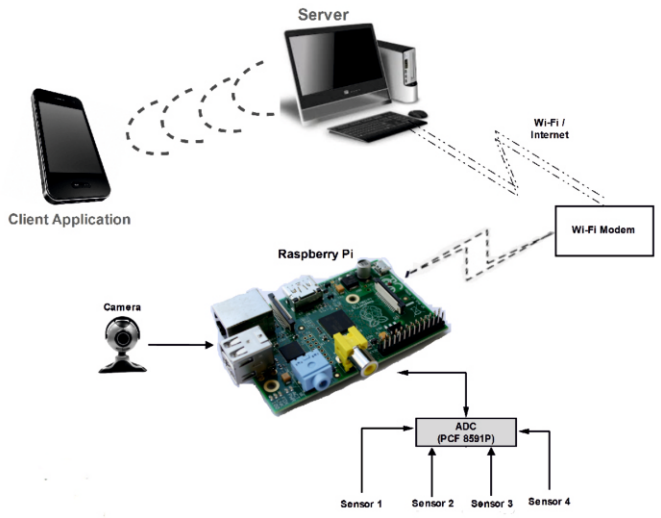
Android:
Android is a Linux-based operating system primarily designed for mobile devices such as smartphones and tablet computers utilizing ARM processors.

Advance java Component:
"Swing "is the primary Java GUI widget toolkit.

The Abstract Window Toolkit (AWT):
it is Java's original platform-independent windowing, graphics, and user-interface widget toolkit.

VI. SYSTEM ARCHITECTURE

- Initially, all the connections are done from sensors to the raspberry pi. Then code is uploaded in the raspberry pi and a threshold value is set in the code. Then all the data obtained from the sensors is transfer to raspberry pi and pi will send that data to the server using wifi modem. And from server anyone can access the data if he/she has installed our andriod app in their android phone.
- One important component used in the system is sensor. Sensor sense the data from the environment. The system consists of four different types of sensors which collects information of four different parameters of City. The information is in the form of values and the values are send to the server, if that values exceeds certain limit then only action is taken by the server. So on the basis of threshold value set in code, system will give notification on the client android application.
- The overall flow for the system is shown in above figure that is the flow graph for our system.



VII. APPLICATIONS

- City Management and Economic development.
- Energy efficiency.
- Public Health.
- Transportation.
- Security and emergency services.
- Water Management.

VII. EXPECTED RESULTS

- Automatic turn on and turn off street lights depending upon the visibility.
- Detection of accident and sending its information to the nearest Police Station and Hospital.
- Video surveillance for selected area and sending alerts on Android Mobile.
- Detection of contaminated water and sending the information to proper authorities.
- To inform the change in temperature to the citizens through the Android Mobiles.

IX. CONCLUSION

The system developed by using Internet Of Thing will provide the services like automatic street light, video surveillance, weather report, water pollution. It will help in better utilization of available infrastructure facilities and thus provide a decent environment through the smart solutions. So the use of IoT is the best option to make city smart.

X. ACKNOWLEDGMENT

We would like to extend my sincere gratitude and thanks to my guide Dr. M. A. Pradhan, for her invaluable guidance and for giving us useful inputs and encouragement time and again, which inspired us to work harder. Due to her forethought, appreciation of the work involved and continuous imparting of useful tips, this report has been successfully completed. We are extremely grateful to Prof. D.P.Gaikwad, Head of the Department of Computer Engineering, for his encouragement during the course of the project work. We also extend our heartfelt gratitude to the staff of Computer Engineering Department for their cooperation and support. We also take this opportunity to thank all our classmates, friends and all those who have directly or indirectly provided their overwhelming support during our project work and the development of this report.

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